DOCUMENT RESUME

ED 348 972 IR 015 650

AUTHOR Lucero, John A.
TITLE A Study To Increase Computer Applications in Social Work Management.
PUB DATE Apr 92
NOTE 85p.; Continuing Education Self-Directed Learning Project, Behavioral Sciences Regulatory Board.
PUB TYPE Dissertations/Theses - Undetermined (040) -- Information Analyses (070)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Artificial Intelligence; Counselors; Databases; Higher Education; *Management Information Systems; *Mental Health Workers; Professional Training; Psychiatric Services; Psychological Testing; *Social Workers; Spreadsheets; Therapy

ABSTRACT

The purpose of this study was to address the use of computers in social work practice and to survey the field for tools, concepts, and trends that could assist social workers in their practice. In addition to a review of the relevant literature, information was requested from the Social Work Service and Ambulatory Care Database Section at Walter Reed Medical Center in the District of Columbia, and from the School of Social Welfare at the University of California at Los Angeles. The review of the literature focused on issues regarding information management systems for social work practice and computer applications in the areas of psychological testing, DSM-III evaluation, psychotherapy, psychopharmacology treatment, family therapy, consultant liaison psychiatry, chronic care, geriatric psychiatry, neurobehavioral training, computer games in child psychotherapy, patient education, music therapy, therapy for addictions, full-service psychiatric programs, computer imaging, the computerized electroencephalograph (EEG), psychiatric research, computerized second opinions, expert systems, and "neural" computers. Computer applications in the social work curriculum are also discussed. Ways in which word processing, databases, spreadsheets, and information management systems could be used in social work are suggested, and a discussion of the implications of computer use for social workers concludes the report. Appended materials include a glossary of computer terminology, a description of an appropriate computer system, a checklist for developing an agency database system, and a list of computer software that could be used by social workers to enhance their work and computer skills. (Contains 83 references.) (BBM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

IR

A STUDY TO INCREASE COMPUTER APPLICATIONS IN SOCIAL WORK MANAGEMENT

ED348972

by

Dr. John A. Lucero

A Self-Directed Learning Project Presented to the Behavioral Sciences Regulatory Board in Partial Fulfillment of the Requirements for Continuing Education Credit

April, 1992

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
John Lucero
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR015650

TABLE OF CONTENTS

	Page
TABLE OF CONTENTS	ii
ABSTRACT	iii
INTRODUCTION	1
BACKGROUND AND SIGNIFICANCE	3
PROCEDURES	5
LITERATURE REVIEW	6
DISCUSSION, IMPLICATIONS, AND CONCLUSIONS	38
Computer Applications in Social Work Curricula	39
Management Principles	42
Applications for Social Work	43
Database	43
Spreadsheets	44
Computer Management	45
CONCLUSIONS	49
BIBLIOGRAPHY	53
APPENDICES	
A. GLOSSARY OF COMPUTER TERMINOLOGY	60
B. COMPUTER DESCRIPTION	65
C. CHECKLIST FOR DEVELOPING AGENCY DATABASE SYSTEM	67
D. COMPUTER SOFTWARE	69
Computer Software	70
Renaissance Series Adolescent and Child Reports	72
Rennaisance Series Adult Reports	74
Clinical Assessment for Social Workers	76
Psychiatric Computing	79

ABSTRACT

The purpose of this study was to address the use of computers in social work practice and to survey the field for tools, concepts, and trends that could assist the social worker in his or her practice. The study concerns itself with automation; specifically, the computer. The study of computers (and computer programming) as a management tool was undertaken to determine if it has any value to social work practice. Also examined were the six most popular applications of the computer in management--word processing, database, spreadsheets, graphics, games, and telecommunications--and how they can assist the social worker in his or her adherence to the four basic principles of management: planning, organizing, controlling, and directing. A review of the literature focused on issues regarding information management systems for social work practice. An overview of contemporary issues, technological developments, areas of application, and conclusions were provided to support the integration of computers in social work practice.

The findings of this study could be used to provide justification to support computer applications in social work practice. The result could be the acquisition of a computer system such as the one described in Appendix B.

In addition, the Information Systems Department at Walter Reed Army Medical Center provided a checklist (Appendix C) that can help identify the need for a computer system for the social work practitioner. Equally important is a glossary of computer terminology (Appendix A) that was provided by Major Stephen M. LaMarche, United States Army, in order to familiarize social workers with computer terminology. A list of computer software (Appendix D) was compiled to illustrate how social workers can utilize computer programs to enhance their work and computer skills.

INTRODUCTION

The purpose of this study was to address the use of computers in social work practice, to describe some of the advances in computing that have potential for application in social work, and to underscore the significance of equipping graduates of social work programs with information management skills that have relevance to social work practice. Despite the proliferation of computer technology, most human service practitioners are at a primitive state of development in their utilization of computers (LaMarche, 1987).

A preliminary analysis of social work curricula suggested that the profession may not be preparing its students to take advantage of existing computer technology (Hasenfeld, 1987). An overview of contemporary issues, technological developments, areas of application, and conclusions are provided to support the integration of computers in social work practice.

In describing the significance of information technology in medicine, Levinson (1983) stated that "The physician who believes that optimal management of each patient can be met by the human mind aided by an occasional use of reference texts is practicing self-deception."

The same could be said of social workers who hold a similar view. According to Mathisen (1987),

> To allay clinician fears, emphasis should be given to accurate, nonthreatening descriptions of computer-based clinical tools and to education about the well-documented fact that the majority of patients enjoy interacting with computers. Consideration should be given to the possibility that computer applications may best be suited to assisting nonexpert users, although they have been most frequently tested in research settings, with highly trained professionals as interested users.

Mathisen (1987) further urged impact studies, replication by researchers not involved with the development of the particular application, and moving beyond computer technology as an end product of research towards its rightful position as a means of answering clinically relevant questions.

The failure of any human service organization to take advantage of the available computer technology can only mean that it will not realize its potential (Mathisen, 1987). Schwartz (1985) suggested that "All mental health professionals should become involved and take an interest in computers." According to an article in Psychiatry (1985), Schwartz states "If you abdicate your responsibilities in the use of the computer, that responsibility will be taken on by other people who do not have the same concern about human beings and their privacy and feelings as you do. Systems will evolve that may be quite injurious to your patients. I strongly encourage the mental health professionals to make sure that their mental health organizations are active in the computer field and learn how

computers are being used, even if they themselves are not very excited about their use. If you do not have some say about computer use, other people will have a large say."

Though an effort was made to develop this paper from a social work perspective, an overview about the evolution of computer technology is provided. Computers permeate our society. They are in automobiles, video games, and security systems; they are impacting health care, financial markets, leisure time, children, and the future (de Anda, 1987).

BACKGROUND AND SIGNIFICANCE

In social work practice, it is necessary for social workers to learn basic management skills and to survey the field looking for tools, concepts, and trends that could assist them in their work (LaMarche, 1987). According to LaMarche (1987), it is essential to examine the use of the computer as a management tool and determine if it has any value to social work practitioners.

Computer technology has evolved in the last forty years from a collection of vacuum tubes to more affordable micro-processors (LaMarche, 1987). According to Parker and associates (1985), the evolution of computer technology has helped to improve social work practice. King (1984) suggests that social workers can now have computer centers that were previously available only to corporations and universities.

During the 1950s and 1960s, the transition in computers went from vacuum tubes to transistors to the use of

integrated circuits. The improvement in computer sciences provided discipline and intellectual structure for computer hardware and software development (LaMarche, 1987). In the 1970s and 1980s, computers were developed that were more reliable, smaller, and less expensive to purchase. Levinson (1983) suggested that computer networks allowed for the integration of systems, and that "Major efforts are underway to produce practical applications of artificial intelligence."

Since the development of the computer, progress has been made from basic language to a higher order of program languages such as Cobol or Fortran. Parker and associates (1985) reported that a number of languages have been used in social science programming, with Basic and Pascal initially the most prominent. The Massachusetts General Hospital Multi-Programming System (MUMPS) language has been accepted by the Veterans Administration and is used to achieve a degree of language uniformity (Levinson, 1983).

Artificial intelligence programs that approximate sophisticated diagnostic and therapeutic decision-making processes have been under devlopment since 1980 (HEW, 1987). Parker and associates (1985) reported that the Department of Veterans Affairs was developing a system for its mental health centers that could store and retrieve records, run diagnostic tests, and develop psychological histories. Lieff (1984) reported that some proprietary psychiatric hospitals were developing computer systems along the same

lines as the Department of Veterans Affairs. King (1984) described computer applications by social workers in hospitals and clinics.

According to LaMarche (1987), equipment and automation could help social workers store and retrieve patient clinical data, as well as understand management and treatment techniques in patient care. The social work manager can be helped by having information on patient characteristics in order to plan, report, and evaluate the services provided. A clinical supervisor can use the computer to monitor and evaluate progress of other staff with some freedom to prioritize both clinical and administrative responsibilities. King (1984) stated that "Computer support can help social workers be more creative in attacking the multiplicity of problems encountered in practice."

PROCEDURES

The intent of this study was heuristic--that social workers would view computer utilization as extensions and enhancements of their own cognitive functioning (Pardeck and Schulte, 1990).

The following procedures were followed: (1) Review relevant literature; (2) Gather information from the Social Work Service and Ambulatory Care Database Section at Walter Reed Army Medical Center in Washinton, D.C.; and (3) Gather information from the School of Social Welfare, University of California at Los Angeles.

LITERATURE REVIEW

There is an extensive literature that deals with information management systems. For the purpose of this paper, it was relevant to review concepts in computer applications from education, psychology, psychiatry, and social work. Practical, cost-effective systems have been available since 1983 for automated patient records, hospital/clinical management, decision-making, electronic mail and message services, literature searches, and quality assurance protocols (Levinson, 1983). Computer utilization by social workers in hospitals and outpatient clinics have also been described (Flynn and Kuczeruck, 1984; King, 1984).

A number of representatives from the medical field have attempted to describe their profession's inertia in fully embracing computer technology (Barnett, 1984; Blum, 1983). Lieff (1984) suggested that developments in physician use of computers comes from the incidental learner -- Hobbyist-physicians who are discovering the clinical potential of inexpensive micro-computers.

Parker and associates (1985) conducted a review of social work curricula by analyzing the courses offered in social work graduate programs in the area of information management systems. Sampson and associates (1985) provided

criteria to assist in the process of evaluating software for testing and assessment in clinical social work practice. Griest (1984) claimed that the collection of psychiatric information when solicited by computer is more comprehensive than when traditional methods of data collection are used.

According to Lieff (1984), perhaps the best frontier in computer application is in the area of psychotherapy. Computers are used in diagnosis, biofeedback therapies, patient education, nutrition, and physical fitness. Barnett (1984) argued for computer support in the management of patient data. The patient's record is the principle document for insuring continuity and quality of care. This documentation will impact on reimbursement for services because it is based on authentication of specific types of data. Quality assurance is also an area that needs a database source. Stoloff and associates (1991) suggested that office automation is useful for scheduling, client billing, and client record keeping.

From another educational perspective, "The obstacle to integrating technology into the college curriculum is not the technology itself. It is people" (Mayor, 1992). According to Mayor, "Technology requires a different way of thinking about the learning process. We have to get faculty to see that it is worth their time. Professors should understand that it is all right to admit that they are ignorant about computer technology and ask questions. Once you get them hooked, faculty members come along and technology works."

In the field of education, Robinson (1987) reported on a study about the effectiveness of a computer-assisted system to deliver an introductory course on educational computing to elementary and early childhood teachers. Thirty-three subjects were enrolled in a Computer Literacy for Teachers program during the 1986 spring semester at the Indiana University of Pennsylvania. The teachers worked in pairs and received fifteen hours of instruction via an Apple IIc microcomputer. The Minnesota Computer Literacy Awareness Assessment (MCLAA) was used as both a pretest and a posttest to measure items such as enjoyment, anxiety, efficacy, education, social values, and technical values; and cognitive knowledge of hardware, software, programming, computer applications and their impact. Analysis of the MCLAA results revealed a significant difference between the mean scores on the pre- and posttests on every component except social values, and there was a substantial change in the affective total, cognitive total, and overall total between the two tests. Responses to a questionnaire were idiosyncratic and did not identify any common areas of concern. All of the students (teachers) considered themselves computer literate at the end of the course.

Dunn (1985) reported on an inservice training program that was implemented by the Community College of Allegheny County (CCAC), Pennsylvania, in order to help vocational educators and administrators develop skills in computer applications, software evaluation, and computer-based

training. Dunn presented descriptive information on (1) the program's audience (i.e., 76 vocational educators and administrators representing a wide range of disciplines and computer sophistication); (2) attendance (i.e., the majority of attendees particpated in at least sixteen of a total of twenty-one hours of instruction provided); (3) cost effectiveness (i.e., the total cost per person was $250.00, making the training more cost effective than outside training); (4) the need and rationale for the program, the problem addressed, goals and objectives, limitations, and solutions to limitations; and (5) program development and implementation, which involved needs assessment; assessment of knowledge level; generalizable topics, available resources, and needed computer skills; and development of evaluation instruments. Results indicated that the vocational educators and administrators felt positive and enthusiastic about all aspects of computer applications.

Poirot and Heidt (1982) reported on faculty attitudes toward computers for use in planning for the implementation of microcomputers in school districts, suggesting that early introduction of computers to students allows for the development of computer expertise and skills so as to appreciate the need for computer applications in education.

In the area of educational testing and assessment, the literature is replete with examples of computer applications that have the potential to be utilized in social work education and practice.

Torardi (1985) described procedures used to construct and validate the Standardized Test of Computer Literacy (STCL), a criterion-referenced instrument designed to assess students' computer literacy. The procedures included (1) defining the content and identifying objectives for the areas of computer attitudes, computer systems, computer applications, and computer programs; (2) gathering computer literacy competencies from the literature, to include the Computer Anxiety Index and the Beliefs About Computers Scale; (3) development of 156 test items by fifteen Iowa State University computer literacy specialists; (4) pilot tesing involving empirical item analysis based on administration to forty-four college students and judgmental item analysis by nine computing instructors; and (5) collecting reliability, validity, and normative data on the final 80-item test. Results revealed that the STCL was both a valid and reliable measure of computer literacy.

Hsu and Sadock (1985) provided an overview of the applications of computer technology to construct test items and/or to formulate tests according to strategies programmed by test constructors, or pre-constructed by item writers and stored in computer memory. The tests may be administered interactively by the computer or as paper and pencil tests. Studies dealing with computer applications in item construction, item banking, test design, and test administration (both adaptive and nonadaptive) are grouped for review in four sections: (1) theoretical and

philosophical propositions; (2) application and implementation; (3) evaluation and research; and (4) prospects for the future and implications for educational testing. It was concluded that while there may have been attempts to utilize computers for test construction, actual, successful, large scale applications are relatively few. Most of the applications use computers to replace paper and pencil tests or human labor. With the exception of adaptive testing, there is little documentation to show that the quality of assessment processes are improved by computer utilization. However, with continuing technological developments to overcome computer limitations, and with attention to measurement quality, the future of computer-assisted construction should be very bright.

Oosterhof and Salisbury (1989) reported that the Assessment Resource Center (ARC) at Florida State University provides computer-assisted testing (CAT) for approximately 4,000 students each term. Computer capabilities permit a small proctoring staff to administer tests simultaneously to large numbers of students. Programs provide immediate feedback for students and generate a variety of reports for instructors. Courses using ARC for testing are required to provide an optional retest opportunity for students. Course objectives, test items, and related instructional materials have been developed by teams of instructors with an expert in testing and instructional devlopment. The ARC experience has identified three measurement and two instructional

design considerations that are crucial to the effectiveness of CAT operations in instructional environments: test quality; confidence in mastery decisions; maintenance of test validity; the quality of instructional objectives; and extended feedback following testing. The lack of effective methods to clarify test-identified learning deficiencies is the greatest weakness in the present ARC operation. Guidelines for producing and evaluating instructional objectives, test questions, and remediation procedures should be a central component of future CAT software documentation. Inappropriate computer applications to testing will have unfavorable effects on both the quality of instruction and the perceived benefits of educational measurement.

Olsen and associates (1990) described the development, district-wide implementation, achievement results, and validation evidence for a computerized testing system for state assessment preparation. The Wicat Skills Assessment Test was developed and delivered using the Wicat computerized testing system. The test was developed to provide teachers with predictive and prescriptive information and principles with information concerning expected student performance on state assessment objectives.

Anbar (1991) used interactive computerized tests that accept unrestricted natural-language input to assess the knowledge of 125 medical students in a sophomore course on clinical biophysics. The test was composed of open-ended

sequential questions and multiple-choice questions on the same material. The scores for the two testing modes were correlated, paying special attention to answers that demonstrated a flagrant lack of knowledge, corroborated by subsequent answers. The correlation between the qualities of the answers for the two testing modalities was significantly positive for the lower half of the class and negative for the upper half, suggesting that the two modes of testing measured different aspects of competence. Thus, computerized open-ended tests can emulate an oral examination environment and may be a more effective measure of a student's knowledge than multiple-choice tests.

Harris (1990) described and verified four LOGO-based, computer adaptive angle and distance estimation assessment tools for internal consistency, test/retest reliability, and construct, face, and content validity. The methods delineated served as the foundation for a call for similar instrument verification in other educational research. Issues concerning the appropriateness of traditional notions of instrument reliability and assumed distinctions between measurement instruments and learning tools were also discussed by the author.

Hansen (1986) described five progressive stages of computer assisted assessment. They are: (1) scoring inventories; (2) development of computer-generated interpretive reports for inventories and tests; (3) computer-administered inventories; (4) graphics software adapted for psychomotor

assessment; and (5) the capacity of computers to give tests, compute scores, print results, and provide interpretive comments and diagnostic information for the full range of psychological assessments.

Meier and Geiger (1986) address the ethical and pragmatic issues, which have yet to be incorporated into professional training and continuing education, raised by the introduction of microcomputers. Meier and Geiger (1986) emphasize the need for interpretive skills, knowledge in computer-assisted assessment, consumer information, a realistic view of computer feedback, multiple information sources, and confidentiality. It was advocated that all graduate students in the helping professions complete a course in computer applications in human services.

Ward (1984) discussed the benefits available from using computers to administer the kinds of tests that are most familiar in educational environments. According to Ward (1984), there are four applications that represent current or near-term enhancements: (1) computerized adaptive testing, (2) diagnostic testing, (3) test preparation, and (4) simulations of complex problem situations. The applications offer improvements, including the individualization of assessment, increased accuracy, efficiency in handling test information, more detailed information to guide instruction, and decreased costs.

Roeber (1984) discussed problems for teachers in the application of microcomputers to assessment of achievement and instruction, noting that these problems must be overcome before the potential of the microcomputer can be realized. It was asserted that teachers need (1) to be comfortable with microcomputers, (2) to learn more about tests and the testing process, (3) to learn more about computer programs available in development and use of tests, and (4) to receive instruction on test analysis.

Nelson (1984) described how computers can help in several areas of student assessment. These areas include scoring tests, reporting results to students, recording results in class grade records, deriving final grades, and reporting final class grades to students and administration. Additional areas of computer application include assessment of test quality, scale analysis, feedback on instruction, and determination of affective reactions to educational scales.

Lord (1977) argued that (1) conventional testing and computer-generated repeatable testing (CGRT) are equally effective for estimating examinee ability; (2) CGRT is more effective than conventional testing for estimating the mean ability level of a group; and (3) CGRT is less effective for estimating ability differences among individuals. These conclusions were drawn from domain-referenced test theory as distinguished from norm-referenced test theory.

According to Knowles (1980), "Computer-Assisted Instruction (CAI) remains in widespread use, especially in industry and technical education." Knowles suggested that programmed instruction, "especially when based on branching, is an effective source of self-directed learning when students take the initiative in using it and when they have one or more persons to interact with while using it." Knowles (1980) argues that "Programming techniques will provide more varied types of programs--some effective primarily for helping individuals discover basic facts and principles, but others effective for learning difficult aesthetic or critical discrimination, analytic skills, problem-solving abilities, and even more creative approaches to problem-solving."

From the psychology profession there is a literature that focuses on computer applications in the area of testing. This segment of the literature review centers on the utilization of computers to enhance clinical practice. The relevance to social work practice is to realize that information technology and computer applications can help promote the health and welfare of clients.

In regard to research, Tombaugh (1983) discussed issues and techniques useful to psychologists interested in applied research for computer applications. Applied research includes guideline research, product development evaluation, and field trial evaluation. Suggestions for improved guideline research involve screening the problem to

determine its usefulness and screening the design to make sure it involves representative tasks and materials for the desired generality. Product development evaluation requires techniques for testing users that are fast, flexible, and inexpensive, such as "user trials" of products in ergonomics and "user edits" for testing documentation. Field trials of office automatiion or videotex systems lead to decisions about further introduction of those systems.

In regard to assessment, Ben-Porath and Butcher (1986) reviewed the use of computers in processing psychological test data, services available, and prospects in the field. Since the first uses in 1950, computer-aided personality assessment has grown rapidly. Three types of scoring services--central processing, teleprocessing, and local processing--are available to supply scoring reports and descriptive reports for assessment instruments. Studies reveal that computer-based test interpretations (CBTIs) are more efficient than are clinician interpretations. CBTIs seem as valid as other forms of reports, and no significant differences have been found between the reliability of computerized and conventional test administration.

Moreland (1985) provided a status report on the use of computers in psychological assessment. On the basis of the data available, it was suggested that computer and conventional administration of objective personality inventories and ability tests are likely to produce equivalent results. Subjects were sometimes more honest

responding to a computer than responding to an interviewer and have expressed a preference for computer over conventional test administration or interviewing. Data on computer-based test interpretation were few and conflicting. The computer is not yet capable of besting an expert neuropsychologist or physician but can be programmed to interpret the Minnesota Multiphasic Personality Inventory (MMPI) at least as well as human experts.

Lanyon (1987) contended that research technology for demonstrating validity of computer-based psychodiagnostic assessment is available. Six recommendations were offered for other development: (1) attend to the reliability of all variables; (2) focus on specific (narrow-band) predictions; (3) restate empirical findings in their raw and perhaps contradictory form; (4) apply each system only to populations that resemble the derivation population; (5) use the "no-interpretation" option; and (6) build in a capacity to accomodate varying base rates. It was suggested that use of these guidelines could result in simpler, more specific systems to be viewed as tools for the assessment psychologist and not as finished products.

Celotta and associates (1986) reported on three types of software that counselors and human development professionals can use: (1) needs assessment, in which children complete a survey concerning school, home, general skills, and general concerns; (2) data-based management, which provides for structured input for the categories of

counseling objectives, measurement methods, and interventions as well as descriptions of various aspects of the counseling process; and (3) program evaluation, which analyzes and displays data from evaluation surveys administered to students, parents, and teachers. The authors concluded that computers can be a valuable asset in the counseling profession and that proper training for counselors is needed in order to reap the benefits the computer has to offer.

Sampson (1990) analyzed trends (computer-based test interpretation, computer-assisted instruction, integration of audiovisual media, adaptive devices, and computer-assisted research) in computer applications in testing and assessment in relation to goals of counseling psychology. Goals of counseling psychology include remediation and rehabilitation, education and development, prevention, and service to diverse populations. Some issues related to goal integration are: (1) commitment of human and fiscal resources, (2) research priorities, and (3) ethical concerns.

Canfield (1991) attempted to test the validity of a computerized coding/rating system of the psychological content of verbal therapies. In three different conditions, six female undergraduate "interviewers" were instructed to engage three female undergraduate "clients" in conversation about (1) emotions, (2) cognitions, or (3) contracts (relationships or values). Results supported the hypothesis

that the taxonomy and computer program accurately describe utterances in the dimensions of emotion, cognition, and contract.

Erdman and Foster (1988) presented a discussion of ethical issues involved in computer applications in mental health, particularly regarding computerized psychological testing and interpretation. It was argued that in some cases the use of computer-based assessment may be at least as ethical as clinician assessment, if not more so. While ethical problems exist relative to computer-based test interpretation, these should not preclude the use of the technologies, but rather signal the need for careful use. Some concerns covered include: (1) dehumanization, (2) non-validated computer test interpretation, (3) the use of computer assessment by untrained individuals, (4) potential negative effects for minorities, (5) cultural bias, and (6) covert and omnipresent assessment. It was concluded that computer-assisted assessment is a powerful tool, and its development and empirical testing should be considered separate from ethically objectionable patterns of misuse.

Murphy and Pardeck (1988) reported that the applicatiion of computers in practically every area of clinical practice has raised ethical problems and introduced several logistical and procedural difficulties. Here, the critique of computerized clinical evaluation is expanded through a consideration of the computer "microworld." The rubrics of this microworld are examined, and it is argued

that they contain unwarranted assumptions about the nature of social reality that may adversely affect clinical practice.

Dutro (1983) reported that the use of computer-assisted programs in career exploration and occupational information is well documented. Various phases of the vocational counseling process (i.e., diagnostic evaluation, program planning, career exploration, case management, and program evaluation) offer opportunities for computerization. Using the Massachusetts General Hospital Multiprogramming System (MUMPS) File Manager System, the Loma Linda, California Veterans Administration Hospital Rehabilitation Psychology Department developed a system that adapted the file manager system with the development of branching logic necessary in designing vocational rehabilitation interviews, questionnaires, and client treatment plans. Using this system the counselor is able to select information from predetermined sets of information to match the client's situation and characteristics with available services and programs. The Loma Linda staff also developed a psychodiagnostic assessment system to accomodate graphics software, multiple norms, timed tests, and a case management program that allows for monitoring the client's progress.

From the field of psychiatry, Schwartz (1985) reports that "One of the valuable ways a computer can be used in the mental health profession is through the use of a database, which enables the rapid access of specific amounts of

information." According to Schwartz (1980), some applications of these databases include: (1) Literature Searches- The ability to obtain references to articles on subjects written during a particular time period; (2) Consultation- Some databases can enable one to have access to a library of information regarding various disorders, drugs, etc.; (3) Continuing Education - Continuing medical education is growing, but limited in detail and data; and (4) Record Keeping - Billing and accounting. Schwartz suggested that "These databases are not exhaustive, not always well focused, and some learning is required."

Griest (1987) suggested "Using a computer for interviewing and diagnosing patients." Using the National Institute of Mental Health Diagnostic Interview Schedule (DIS), Griest conducted a study of 150 patients in which trained interviewers administered both computer and personal interviews (Psychiatric News, 1987). Griest stated that "For the DIS, the bottom line message is that it doesn't make any difference whether you do it with a human or with a computer." Diagnostically the human interviewers and computers showed high agreement about overall categories. Computers diagnosed for more disorders than did clinicians. It seemed clinicians underdiagnosed while computers overdiagnosed (Psychiatric News, 1987). According to Psychiatric News (1987), "Completion rates were the same with both computer and personal interviews, but both sexes were more comfortable with the computer interviews.

Patients opted for the computer when revealing socially deviant behavior, such as suicidal ideation, illicit drug use, or homosexuality." According to Griest (1987), "The use of inhuman devices is not inhumane, although it would be ironic if the most human of all therapies were to be provided by computers."

Lieff (1984) reported that clinical applications for computers include patient screening, administration of diagnostic questionnaires, clinical research, and maintenance of ongoing clinical database. Some of these applications will not come into widespread use in psychiatry until psychiatrists and psychologists begin to design computer programs to fit the particular needs of the profession (Lieff, 1984).

According to Kolodner (1984), "Computers are an aid in making clinical decisions; and to make decisions, the clinician must synthesize a vast amount of information; the more information, the better the decision."

Lieff (1987) reported that "Patient acceptance of computerized history taking is high, many people feel less embarrassed about giving personal information to a machine than to a psychiatrist. Most studies have shown that the record is more complete and thorough when it is gathered by a computer." Lieff (1987) discussed the clinical utility of computers in the following twenty areas:

(1) Psychological Testing: Advantages to computerized psychological testing compared to handwritten tests include the opportunity for patients (a) to return to specific questions without seeing all of the previous questions; (b) to present one question at a time to avoid inadvertently answering the wrong question; and (c) to accomplish the testing at any convenient time, rather than only by appointment with the clinician.

(2) DSM-III Evaluation: The development of decision trees that can be used by both physicians and patients has increased the potential uses in DSM-III evaluation. With the development of the more precise DSM-III, computer interviewing has become practical. The standardization of the clinical interview has included the "Schedule for Affective Disorders" (SADS), the "National Institute of Mental Health Diagnostic Interview Schedule" (NIMH-DIS), and more recently a new "Structured Clinical Interview for DSM-III" (SCID). Interviews with patients answering the questions themselves at the computer terminal are noted to be highly reliable compared with the clinician performing the same questioning. Clincians have noted tht the interview often gives added information and perspective. The most serious problem with these standard tests is that they don't address the issues from the experienced clinician's intuitive interview. But it is possible that the combination of computer and intuitive interviews is superior to either alone.

(3) Treatment: The most controversial topic in psychiatric computing is the use of computers for psychotherapy. Feedback from computer programs can have lasting emotional impact upon patients. There are at least two critical factors in determining the efficacy of computer techniques in therapy: the appropriate choice of specific patient situations and techniques, and the specific ways that the software are designed to interact with patients. Computer programs can only deal with therapy that is specifically focused, where there is enough objective information concerning specific choices of direction in the therapy. The focused behavioral therapies have been particularly appropriate for these techniques.

The second major issue, that of the proper design of computer programs to facilitate patient interaction, includes the need for the computer-patient interaction to work effectively and to be designed to respond to the patient's expectations.

(4) Psychopharmacology Treatment: The computer database is a natural aid for the psychopharmacologist. Clinicians must organize the details they will use to structure treatment decisions. This information can be individually entered into a database program by the psychiatrist, or the secretary, and updated as new information appears.

There is no other area of psychiatry that so readily lends itself to computerization as does the description of medication usage. Graphs can be generated comparing

medication dosage with other variables such as the severity of patient symptoms, psychological test scores, and serum blood levels. Information can be gained from these charts and graphs that would be difficult to ascertain in any other way. Computer systems that have reminded physicians of important clinical facts before allowing a prescription have decreased medication errors.

(5) Family Therapy: Of all fields of psychotherapy other than behavioral therapy, perhaps family therapists have developed the most new approaches to computerization. Programs for marriage and family clinics have allowed tracking the effectiveness of specific techniques and evaluation tools and have been helpful in observing and documenting the effectiveness of specific types of therapy. The rating of severity of each problem, a subjective rating given by therapists, is used as a source of information to trace the resolution of the problem. Progress notes include an English text version as well as data fields for quantification of the exact type of intervention that is made and the general improvement level of each problem.

(6) Consultation Liaison Psychiatry: Consultation liaison psychiatry requires a rapid consultation response for many different types of medical and surgical patients. The computer database in this case must reflect the specific reasons for the consultation as described by the referring physician and must relate the description of the psychiatric problem to a detailed understanding of the medical

situation. Immediate communication back to the referring physician is generated from a checklist as information concerning the therapeutic intervention is codified. Computers are helpful because of the unique rapid turnover of cases on the inpatient setting, and the need for coordination of the supervision of the different residents seeing cases.

(7) Chronic Care: In the field of institutional care of the chronically mentally ill patient, the database program can provide aid in the tabulation of treatment and the evaluation and coordination of clinical treatment plans. If treatment approaches and observed behaviors are carefully entered into the database, new and useful correlations can be noted. The range of possible variables that can be entered into the database program includes the chronology of certain symptoms and behaviors; family crises; stressors and precipitants; responses to medications; responses to different therapists; approaches and interventions; drug interactions and allergies; and appropriate dosages and blood levels of anti-seizure or psychotropic medications. Many of the correlations that can be derived from such a system would otherwise be impossible because of the amount of time that is needed to search manually through years of old hand-written records.

(8) Geriatric Psychiatry: One of the critical areas of concern for the psychiatrist is monitoring an elderly patient at home. This includes monitoring patients who may

endanger themselves by wandering, or medical patients who could be very ill at home without observation. For this purpose, there are many computerized gadgets that can be very helpful for the elderly patient. A computer robot arm that can help with activities of daily living may be helpful for handicapped or home-bound patients. In research settings robot arms have been able to help ambulate patients, help patients in and out of bed, and help with certain aspects of housework, especially lifting objects and reaching high items. Robot systems could also include vocalizing intelligent messages. Since the field of geriatric psychiatry incorporates a large amount of medical information, it lends itself to computer data gathering.

(9) Neurobehavioral Training: Cognitive retraining of the brain after a stroke or other injury is a difficult, time-consuming process. It is arduous because drills must be repeated for months or years. The computer is well-suited for this because it can present text or graphic stimuli in a repetitive manner.

Programs could be effective for many types of relearning and rehabilitation therapies, but perhaps visual perception and memory are especially well-handled by computer programs. Video computer tools are very practical. Patients like the video games and participate, even if they have been previously uncooperative in other types of training.

Training for aphasia patients after the initial recovery period is a long-term process of increasing communications. One program for aphasia (REMATE) has been effective using long distance telephone therapy for disabled veterans in hard to reach rural areas of the country. Patients have included those with aphasia, hearing disorders, and articulation disorders. Because all of the training is done by special computers linked by telephone, those who are unable to travel to a local rehabilitation center can receive therapy at any time.

Computer-based tutorials for children with significant learning handicaps are designed to be used by the child, with or without the teacher. Interactive games and word processing programs are especially useful to help a child gain a feeling of confidence. Many handicapped children find writing by hand very difficult, avoid complex communications, and therefore do not have the opportunity to appreciate the more gratifying and creative aspects of advanced writing such as story telling. Using computer word processing and spell checking programs, patients can gain mastery in writing sklills without worrying about many of the problems that have perpetuated the handicap.

910) Computer Games in Child Psychotherapy: Popular computer adventure games use a format of towns and cities where the child looks for treasure but meets up with monsters that must be overcome. Children can continue such a game until completion over a period of nine to ten months.

This is done in one-hour sessions. Along the way, the children deal with frustration, defeat, and success, and they can turn to the therapist for guidance and support. New creative games may provide an advantage by being a motivating factor in the privacy of an ongoing therapeutic relationship.

Computer automated dialogue may be most useful with cognitive theapy, where there is a restructuring of expectations, beliefs and values. Programs have been developed to specifically help adolescents learn new ways of solving problems and to learn to control their impulses, providing coaching and feedback after dealing with different situations.

(11) Patient Education: Many therapists believe that educating patients about health-related issues is an important adjunct to psychotherapy. The problem for the psychiatrist is the orchestration of such an educational process. Some have begun to use the word processor to tailor educational material for the needs of specific patients rather than to recommend books that may go unread.

Another aspect of the computer's use for educational purposes is in training patients on the psychiatric ward who are seriously ill. There is increasing anecdotal evidence that computers can be useful for regressed schizophrenics. This is because of the impersonal manner in which one can develop skills and a sense of mastering in several different ways. Those with very short attention spans have increased

concentration with some computer tasks. Another benefit that has been noted is that patients can express their feelings about therapy and other difficult subjects on the word processor since it is easier to write with the word processor.

(12) Music Therapy: Music is one field of knowledge and practice that is totally transformed by the computer. Music computers allow the user to design any type of sound, then write music scores for production by multiple synthesizers. The music computer allows the user to play a series of notes or rhythms and have the computer record this to be used in a composition. Any sequence can be edited much as one would use a word processor. A new standard "musical instrument digital interface," or MIDI, has allowed all music services to have a standard compatible connection.

Music programs have been used effectively in group treatment for adolescents, older adults, drug and alcohol programs, outpatient and inpatient settings. One technique used in the therapy groups includes a task of executing a "hit record" within a several week period of time or longer, depending on the anticipated length of therapy. The group works under supervision of a therapist to accomplish this task within a specified period of time. Benefits of the therapy also include increased ability to work with others, better frustration tolerance, and improved impulse control. Music therapy has been appropriate for chronic settings such as nursing homes, as well as acute settings.

(13) Therapy of Addictions: A computer medication pump has been effectively used in methadone clinics to measure methadone doses between 1 and 100 mg with extreme accuracy. Upon entering the nursing station, the patient's name is brought up on the screen. All the necessary information for medical and administrative processing is presented to the nurse who then makes the decision to medicate or not, depending upon the patient's medical and administrative status. When the patient is medicated, the screen displays dosage, pickup, and take-home schedules, and dispenses automatically. The nurse functions to confirm the computer's operation and can be more attentive to the patient's condition during the entire process.

(14) Full-Service Psychiatric Programs: There are an increasing number of high-quality full-service psychiatric programs being developed with fully integrated word processors, databases, and communications programs. These programs are designed by practicing psychiatrists to address uniquely psychiatric issues as well as the generic need for ordering information, merging text and data, writing reports, and making decisions. They provide a full range of clinical functions in a program for either individual or group practice. The program can include clinical record keeping, administrative and academic database, intake, diagnostic and treatment modules, report generation, statistics and an expert system program generator including a sophisticated and flexible database.

(15) Computer Imaging: Computer imaging devices use noninvasive techniques to make the internal structures and, more recently, the metabolic functions of the nervous system easily accessible to view.

(16) Computerized EEG: The computerized electroencephalograph is not an imaging device, but rather a picture of a computerized topographic analysis of brain electricity measured from the skull through EEG leads. This is represented as a colorful picture of the composite of brain electricity measured from the surface of the skull.

Computerized systems have been used to study the effects of psychopharmacological agents on brain waves and have noted that many drugs with equivalent therapeutic effects will produce similar EEG effects. The topographic images may show irregularities that correlate with brain disorders, dyslexia and other reading disabilities, and seizures.

(17) Psychiatric Research: Computers have multiplied the kinds of questions that can be asked. There are technological forces now combining to push the frontiers of knowledge about the brain into new levels. Some of these scientific movements are driven by computer advances and are creating new ways of linking the complex information that is needed to describe the brain.

The graphics and calculating capacities are improving the images of the brain and have influenced three

dimensional modeling of chemical interactions used in theorizing about biochemical phenomena such as neurotransmitters, receptors, enzymes, and genetics.

(18) Computerized Second Opinion: Until recently, the medical profession has resisted the concept of computer diagnosis. Such resistance may be reasonable. Ambiguous cases are not easily diagnosed by established decision trees. For clear unambiguous cases, we do not need a computer. Physicians, however, are now becoming comfortable with the different, and less demanding, concept of an "electronic second opinion." Having the availability of selected facts could stimulate further diagnostic investigation in obscure areas.

(19) Expert Systems: These systems are referred to as knowledge-based, or consultation systems. In the ordinary program, all the steps are predesigned by the programmer, but, in the knowledge-based system, the program can work out its own step-by-step procedures. These systems consist of a knowledge base, which is a database with pieces of "if-then" information, and the inference engine that includes the logical reasoning steps.

Diagnostic programs have been effective in making accurate diagnosis in a large percentage of unambiguous cases. There are programs that incorporate DSM-III decision tree questioning of both psychiatrists and patients. Many area of medicine and psychiatry involve so many factors that objective answers are not forthcoming. Decisions are

determined through the use of clinical rules and experience. In these ambiguous situations, the very logic of the decision can be quite subjective and intuitive but in the most complex areas of diagnosis, computers are most useful.

(20) "Neural" Computers: Neurological structures have become models for new computer architecture. New types of hardware that are closely related to the phenomenal speed and complexity of the human brain are being designed. Humans think in many directions at once and associate information widely. Another example of this parallel processing includes the human think tank. In a group of experts with overlapping areas of expertise, the sum of their expertise is greater than any of its parts and new ideas can emerge. This parallel processing of information is a goal of computer architecture.

The utilization of computer applications in social work is now reviewed. According to Born (1987), the microcomputer revolution presents educators with a new set of curricular challenges. How one graduate school of social work (at the University of Maryland, Baltimore) has incorporated microcomputing into its foundation curriculum was described. Through their work with a custom program, four hundred students were introduced to database management at the direct service level. The project had been successful for reasons that have more to do with educational philosophy than with computer technology. The key factors included integrating the project into existing curriculum, making the

assignment part of a required first-year course, and using a computer program designed for novice social work users.

Pardeck and Schulte (1990) described five applications of computerization: (1) inventory testing, (2) client history, (3) clinical assessment, (4) computerized therapy, and (5) computer-assisted therapy. A course of study on computer technology was presented that was designed to prepare professional social workers for clinical practice.

Nurius and associates (1988) reported on a 1985 survey of University of Washington (Seattle) social work graduate students (N = 133) regarding their computer training and experiences in practice and elsewhere, and their attitudes about and interests in computer applications for human services. The authors explored the value of these findings in guiding decisions about curriculum planning, practice development, computer resource expenditures and management, and faculty and agency involvement in this emerging area.

Butterfield (1986) provided an overview of areas in which technology has had an impact and discusses technology's impact in relation to the social work profession. Discussion included employment, education, health care, sensory and perceptual processes, the delivery of human/social services (i.e., automated interviews, interpretation of tests, automated assessment diagnosis, self-help, therapy), social interaction in society, and social policy and human rights.

Gripton and Licker (1986) presented a discussion about the application of computer technology to clinical social work, based on a three-year research and demonstration project on microcomputer applications to clinical social work. The use of computers in social work was reviewed, contrasting developments in this field with those in psychiatry and clinical psychology.

For the social work profession to achieve its potential, there must be an assessment of methods in processing information. Social workers must be willing to learn sophisticated information management methods, adopt new and unfamiliar technologies, take responsibility for the nature and direction of the changes and advances in computer technology, and be willing to creatively utilize computers in social work settings (Parker et al, 1985).

Nurius and Hudson (1988) reported on the development of a microcomputer-based evaluation tool, the Clinical Assessment System (CAS), which was designed for social workers and practitioners from allied professions. The program is user friendly and contains twenty clinical measures tht can be used immediately. Practitioners can add measures that are designed to assess the degree or severity of a client problem. Moreover, the CAS accomodates different types of scales including single-item, self-anchored, multi-item, multidimensional rating scales, checklists, and others.

Hepworth and Larsen (1989) report that computer-aided assessment is a development that deserves the attention of practitioners. Clients reportedly respond well to the use of this technology. The potential for use of this tool derives from the computer's ability to process, integrate, and synthesize data from expanded sources of information. The objectivity of the computer also reduces evaluative errors by subjective interpretations of data by practitioners (Hepworth and Larsen, 1989).

DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

The introduction of computers has contributed to the wide range of human services and the availability of computers has done much to enhance the quality of life (Reamer, 1986). According to Ekstrom and Johnson (1984), "Computers are a topic counselors can no longer ignore. Computers are now being used to provide course and client scheduling; to improve counseling office management; to create, administer, score, and interpret tests; to provide personal and mental health counseling; as tools for research and as aids in writing reports or papers." Ekstrom and Johnson (1984) suggested that knowledge of computer use is a basic part of work in counseling, human development, and the helping professions.

Gelatt (1984) submits that counselors must develop computer techniques to help clients to (1) assess informal needs; (2) assist them with information needs; and (3) teach

personal responsibility. Gelatt (1984) argues that clients will need help from counselors and that computers must be utilized to "Get and use information, make decisions, and learn."

Achievement in computer literacy by social workers is an essential first step in updating social work practice. Unless the social work profession catches up with the majority of other professions, social work will have difficulty in nuturing this valuable intellectual resource (LaMarche, 1987; Parker et al, 1985).

A question often discussed is whether social workers will use creatively the available technological advances in the practice of the profession. It is unusual that the social work profession, generally receptive to sound practice innovations, has been hesitant in recognizing the value of computers in practice (LaMarche, 1987; Parker et al, 1985).

Computer Applications in Social Work Curricula

While changes in technology have been clear and dramatic, have those changes contributed to greater effectiveness in teaching and research? Have they permitted social work educators to improve their preparation of students for social work practice? According to Schneiderman (1987), graduate schools of social work have reported on some of the uses of this new technology, as well as ways in which it has contributed positively to achievement

in the social work education mission. Those uses include televised simulation exercises, and practice with information management systems, database, and word processing.

Schneiderman (1987) writes that "Field instruction remains the essential component of professional education, providing experience in social work practice under the supervision of an experienced mentor." Field instruction, however, is time consuming and dependent upon events in the lives of individuals, families, groups, or communities that neither the student, mentor, or school can control. It is limited in duration and the number and variety of experiences that can be programmed into the education of any one student (Schneiderman, 1987). Cardenas (1987) suggested that televised simulation provides an opportunity for graduate students to practice what they learn in the classroom.

Because of limitations, new information and audiovisual technologies have been used to simulate practice experiences for students in controlled environments. Schneiderman (1987) and de Anda (1987) noted that the use of simulations to teach decision making processes in time limited modules can supplement the natural experience of the field and enhance learning without the fear of hurting others in the process. Equipped with the latest technology, the laboratory setting offers unique learning and instructional opportunities. Students can be recorded and the video

replayed, and the performance can be transmitted simultaneously to monitors in the classroom and conference rooms (de Anda, 1987). Because of audiovisual technology, social work students can practice the skills they will use professionally.

According to de Anda (1987), a video package can be developed to teach methods for observing, coding, and analyzing the interactions between the social worker, peers, and clients. De Anda (1987) claimed that this type of training has implications for both practice and research. It will allow students to collect more accurate information for clinical assessment and determine the effectiveness of their interventions.

Hasenfeld (1987) suggested that social work students must learn how to design a computer information program that can be tailored to their learning needs. He argued that social workers engage in activities that include direct service, social action, advocacy, or community organization. Capturing the information needed and generated by these activities is not straightforward. Social workers need an information system that is flexible enough to meet the needs for information and also relate different sources of information, some represented in numbers or texts. Hasenfeld (1987) suggested that an information management system should provide analyses and reports that facilitate decisions that range from keeping track of a client to determining program effectiveness. Hasenfeld (1987) states

that "Such a system facilitates the ability of social workers to assess, monitor, and evaluate their practice, all of which are essential to improving its quality."

Management Principles

One definition of management is the manipulation of resources in a systematic or consistent manner to an end or objective (Kast and Rosenzweig, 1979). As a social worker moves into management or administrative positions, there are certain functions basic to the accomplishment of management that one must recognize. These are identified in management texts as planning, organizing, controlling, and directing (Kast and Rosenzweig, 1979).

1. Planning concerns itself with
    a. Long range (strategic) direction.
    b. Short range (tactical) direction.
    c. Policies and procedures.
    d. Operating plans.
2. Organizing concerns itself with
    a. Structure.
    b. Delegation of responsibility.
3. Controlling relates to
    a. Development of standards and objectives.
    b. Development of staff performance.
    c. Design of system reporting.
    d. Corrective action when and where needed.

4. Directing is

   a. Organizational and individual philosophy about people.

   b. Creating a result-producing climate, job design, effective communication, small task-specific groups.

To be an effective and efficient manager one must consider each of the basic functions and implement a well-thought-out management plan. To neglect the functions in a bureaucracy would make employment unpleasant for all in the organization (Kast and Rosenzweig, 1979; LaMarche, 1987).

Applications for Social Work

Once the personal computer is available and utilized by social workers, the applications for word processing are numerous. The applications listed below are not comprehensive; however, they indicate areas in which time could be saved (Bykowski, 1982; LaMarche, 1987).

   a. Maintain current information on services available.

   b. Print out resource information onto Rolodex cards.

   c. Provide custom reports to fit agency needs.

Database

Database management is the process of giving data structure, meaning, and retrievability. From that base an individual can extract information, which in turn allows him or her to understand problems, consider solutions and make

decisions (Griest, 1984). According to Date (1986), "Database is a multifile, logically unified data structure created, loaded, and maintained by data management hardware." The following examples are the types of issues that database managers handle well: (1) collect client information (i.e., demographics, case disposition, or time spent on each case) and (2) provide custom reports to fit institutional needs (i.e., personnel evaluation reports) (Nurius and Cnaan, 1991).

Spreadsheets

According to Dowling and Covington (1986), "Spreadsheet software creates tables of numbers for various purposes, arranging them in rows and columns, with the capacity of performing calculations." Spreadsheets are data oriented. One begins with raw data, lays it out on what amounts to an electronic worksheet. One then begins to specify the relationships between the data and the desired results. One will see the input in spatial relationships with respect to computed results (Lamarche, 1987; Raffner, 1982). Some examples are: (1) monitoring work productivity, (2) maintaining personnel information, (3) comparing actual expenditures with budgeted expenditures, and (4) providing custom reports to fit agency needs (Dowling and Covington, 1986; LaMarche, 1987; Raffner, 1982).

Other applications for computers in social work practice are graphics, games, and telecommunications.

Nurius and Cnaan (1991) suggest that graphics use computer output devices such as screens and plotters to produce images: figures and pictures, for example. Graphics applications include generation of graphs and charts of numerical data, computer-aided design and computer-aided manufacturing, and typesetting. Two other examples are the LEGEND advanced administrative software systems and the MicroCase Curriculum Plan. The LEGEND series addresses everything from financial management and human resources to fund raising (CHE, 1992). The MicroCase program is a software-based curriculum for social science instruction (CHE, 1992). Nurius and Cnaan (1991) suggest that games are software programs incorporating the use of enhanced graphics and sound for entertainment or education. Examples are Mario Brothers and Nintendo games; or sports, educational, and therapeutic games. LaMarche (1987) reported that telecommunications software enables communication among computers for sending and receiving information. Some examples are Electronic Mail (E-Mail), Facsimile (FAX), Audix Voice Power (Voice Mail), and the Merlin Legend Communication System (Telephone).

Computer Management

Computer management in social work could reassure practitioners about the ease of using computers. The use of computers would help meet the needs for quality assurance and productivity information. Computer applications could

improve social work management by focusing on objectives, operational subsystems, and utility subsystems. These are briefly defined (Tekini Comp, 1987).

The objectives of a social work information system are (1) maximize the use of limited resources, (2) identify types and quantities of social work services to specified groups of clients, (3) track patterns of social work services and costs, (4) quantify costs and results of social work functions, (5) report intensity and range of social work coverage, (6) insure timely client assessment, (7) identify client discharge problems, (8) improve quality patient care, (9) collect outcome data for targeted problems of clients, (10) determine if clients in need are being served, (11) prioritize high risk patients, (12) detect social factors contributing to excessive cost, (13) help resolve social problems, and (14) facilitate statistical studies.

The operational subsystems that are part of a social work information system are: (1) client information, (2) quality assurance, (3) staff information management, and (4) community resource information.

According to LaMarche (1987), Mattaini and Kirk (1991), and Parker and associates (1985), computer technology is having an impact on clinical and testing assessment in order to utilize computer software in social work practice. That is, computer programs have been developed to administer, score, and provide interpretive reports for a variety of

instruments. The following examples describe a few advantages of computer applications in assessment (Sampson, 1985): (1) cost effectiveness, (2) reduced error rate, (3) research, (4) staff efficiency, and (5) generation of ancillary data--a program can measure response time to test items, thereby making it possible to note slow or rapid responses, or need for assistance.

In the area of clinical history taking, social workers need to be more aware of the technology available for collecting information by computer to augment the more intuitive interview completed by the social worker (Parker et al, 1985).

The problems associated with becoming computer literate are, in part, due to social workers "Missing the boat on educating students and practitioners to automation" (Lamarche, 1987). According to LaMarche (1987), "It is going to be a slow process, catching up to the baseline of computer literacy and usage practiced by other professionals." Within the United States Army, for example, about seventy percent of education centers use IBM-Compatible computers, printers, and software to educate soldiers in the use of automation. The same is being accomplished at the United States Army War College in Carlisle, Pennsylvania; the United States Army Infantry School at Fort Benning, Georgia; and the United States Military Academy at West Point, New York (LaMarche, 1987).

Social work students and practitioners lack computer education, which is something they will either need to learn or for lack of which they will suffer--the workplace will no longer tolerate computer illiteracy (Schneiderman, 1987). Glueck (1974) emphasized the advantage of statistical or clinical prediction. Taintor (1987) urged applications that reduce paperwork associated with clinical practice. Siegal and Alexander (1987) suggest the need for utilization review to expand its purview to cover areas other than the client's diagnostic category.

Ellis and Raines (1981) and Watson (1983) describe the range of uses of computer-based education, including nonprofessionals (e.g., patients and their families), students, and professionals with continuing education requirements. Student use of computer-assisted instruction (CAI) has focused on self-assessment inventories, while professional need has been met more effectively by on-line knowledge-based systems rather than by on-line tutorials (Ellis and Raines, 1981).

According to Nurius and associates (1988), the uses of computer software in social work are: (1) assessment (i.e., interviewing, case recording, progress monitoring, and outcome evaluation); (2) case management (to assist the practitioner in coordinating a treatment plan); (3) input monitoring (to assess the cost of serving clients); (4) progress notes; (5) decision support systems (to use actuarial data--e.g., statistical norms that typify an

agency's experience in providing services); (6) direct services; (7) client education (i.e., psychoeducation programs); (8) outreach; and (9) information and referral services).

CONCLUSIONS

According to Herr and Best (1984), the education and training of professional counselors and allied professionals is affected by changes in professional standards. Within the educational framework of competency-based learning, inclusion of the computer and its impact on the practice of counseling can be approached in three ways--computer as content or subject matter, computer as process, and computer as methods (Herr and Best, 1984).

Computer as content or subject matter includes considerations as basic as instruction in the vocabularly needed to conceptualize and discuss technological implications and as complex as the impact of the electronic revolution on the structures of society within which people live, work, and play.

Therefore, an examination of the social implications about the computerization of America should include: (1) the gulf between the haves and the have nots as a result of the economic restrictions on computer accessibility; (b) the anxiety associated with the changes in the work place; (c) the vastly different computerized environment of the young and its effect on the relationship between generations;

(d) the ability of the handicapped to gain greater participation in society through the use of computerized prosthetic devices; and (e) the possible advent of "the electronic cottage" (Toffler, 1980) and its effect on family and community (Herr and Best, 1984). If practitioners perceive learning as the essence of the counseling process and themselves as agents of change, then consideration of issues such as these needs to be an integral part of the content of professional education programs (Herr and Best, 1984).

Computer as process relates to the concept of computer literacy. Educating practitioners to be computer literate may be restricted to learning the basic processes involved in the operation of a microcomputer or expanded to include a concept of computer literacy more in line with the traditional concept of literacy as it applies to language. Greene (1982) suggested that literacy is most useful when viewed not as an end, but as a means. Attaining literacy is an enabling and empowering process. According to Greene (1982), to achieve literacy is, in part, to learn how to think conceptually, to structure experience, and look through wider and more diverse perspectives at the world.

Computer as method involves learning to regard this technology as an extension of the practitioner's repertoire of tools or techniques for use in assessment, instruction, data management, research, and direct service. Sampson (1983) described an integrated approach using the computer

scheduling, intake, and developing client information systems; in initial assessment aided by computer-assisted testing and interviewing; in interventions that might include computer-assisted instruction; and in a computer-assisted termination interview. Within such a comprehensive context, education programs need to provide practitioners with experience in the use of computers as an adjunct to a variety of counseling functions. In this sense, the computer must be seen as an instrument to achieve clinical or administrative goals (Herr and Best, 1984).

Professional development in computer technology occurs through preservice and inservice activities designed to contribute to the competency of the service provider (Herr and Best, 1984). At issue is clarifying what the practitioner needs to know and for what purpose (Tiedeman, 1983). Sampson and Pyle (1983) reported that education and training programs need to include: (1) the rationale for using computers; (2) operational procedures; (3) intervention strategies; (4) strategies for implementing computer applications into existing services (including staff training); and (5) related ethical issues.

According to Sampson (1983) and Sullivan (1980), practitioners are caught up in an approach-avoidance conflict where computers are concerned. Attitudes range along a continuum from enthusiastic acceptance to outright rejection. Involving staff members in the planning and decision-making phases of any implementation process

minimizes the likelihood of staff resistance, which has been described as a major barrier in the effective use of computer-assisted interventions (Sampson, 1983; Sullivan, 1980).

Herr and Best (1984) suggested that an aspect of professional development is the encouragement of research in the applications of computer technology to direct services and the effective use of research findings in practice. At issue is the comparative advantage of computer technology concomitant with other potential interventions in providing direct services (Herr and Best, 1984).

It appears, then, that the utilization of computers in social work practice is significant. Social workers will need to advance in the use of computers in order to fulfill their role according to the needs of the profession and the consumers of social work services. Therefore, social workers could become more computer literate by: (1) attending workshops on computer utilization; (2) getting "hands on" experience from software vendors or in other educational settings; (3) reviewing the literature for descriptions or evaluations of software; (4) consulting with other professionals; and (5) developing inservice programs (Ekstrom and Johnson, 1984). According to Ekstrom and Johnson (1984), most practitioners have not had exposure to this new technology. Therefore, new skills and knowledge need to be integrated with established professional competence.

BIBLIOGRAPHY

Anbar, M. (1991). "Comparing Assessments of Students' Knowledge by Computerized Open-Ended and Multiple-Choice Tests." Academic Medicine, 66(7), 420-422.

Barnett, G.O. (1984). "The Application of Computer-based Medical-record Systems in Ambulatory Practice." New England Journal of Medicine, 301, 1643-1650.

Ben-Porath, Y.S. & Butcher, J.N. (1986). "Computers in Personality Assessment: A Brief Past, An Ebullient Present, and An Expanding Future." Computers in Human Behavior, 2(3), 167-182.

Blum, B.I. (1983). "Computer Applications in Medical Care: A State-of-Art Survey." Paper presented at 1983 AAMSI Congress.

Born, C.E. (1987). "Microcomputers and Field Instruction." Journal of Social Work Education, 2(2), 69-74.

Butterfield, W.H. (1986). "Computers in Social Work and Social Welfare: Issues and Perspectives. Special Issue: Technology and Social Service Delivery." Journal of Sociology and Social Welfare, 13(1), 5-26.

Bykowski, R.J. (1982). "Computerized Management Information Systems for Hospital Social Work Department." Social Work Administration, November-December.

Canfield, M.L. (1991). "Computerized Rating of the Psychotherapeutic Process." Psychotherapy, 28(2), 304-316.

Cardenas, P. (1987). "Computers in Education: One Student's Perspective." UCLA Social Welfare, 2(2), 10-11.

Celotta, B.; Jacobs, G.; & Keys, S.G. (1986). "Program Development, Management, and Evaluation: A Computer-Assisted Approach. Special Issue: Computer Applications in Testing and Assessment." Measurement and Evaluation in Counseling and Development, 22(1), 19-23.

Date, J. (1986). Databases: A Primer. Reading, MA: Addison.

de Anda, D. (1987). "A Pedagogical Aid: The Student and the AV Lab." UCLA Social Welfare, 2(2), 10-11.

Downing, D. & Covington, M. (1986). Dictionary of Computing Terms. New York: Woodbury.

Dunn, J. (1985). The Computer as a Teaching Tool. Pittsburgh, PA: Allegheney County Community College.

Dutro, K. (1983). The Development of MUMPS-Based Rehabilitation Psychology Computer Applications. Paper presented at the Annual Convention of the American Psychological Association (91st, Anaheim, CA, 26-30 August 1983).

Ekstrom, R. & Johnson, C. (1984). "Counselor and Computer Competency." Journal of Counseling and Development, 63, 196.

Ekstrom, R. & Johnson, C. (1984). "Introduction and Overview." Journal of Counseling and Development, 63, 132.

Ellis, L. & Raines, J. (1981). "Health Education Using Microcomputers: Initial Acceptability." Preventive Medicine, 10.

Erdman, H. & Foster, S. (1988). "Ethical Issues in the Use of Computer-Based Assessment." Computers in Human Services, 3, 71-87.

Flynn, J. & Kuczeruck, T. (1984). "Computer-Assisted Instruction for the Private Practitioner." In M.D. Schwartz (Ed.), Using Computers in Clinical Practice. New York: Haworth.

Gelatt, H. (1984). "Are Counselors User Friendly?" Journal of Counseling and Development, 63, 132-134.

Glueck, B. (1974). "Computers at the Institute of Living." In J. Crawford, D. Morgan, & D. Gianturo (Eds.), Progress in Mental Health Information Systems. Cambridge, MA: Ballinger.

Greene, J. (1982). "Literacy for What?" Phi Delta Kappan, 63, 326-329.

Griest, J. (1984). "Conservative Radicalism: An Approach to Computers in Mental Health." In M.D. Schwartz (Ed.), Using Computers in Clinical Practice. New York: Haworth.

Griest, J. (1987). "Computer-Assisted Diagnosis May Be Answer to Improving Accuracy, Efficiency." Psychiatric News, 17 July.

Gripton, J. & Licker, P. (1986). "Applying Computers in Clinical Social Work." Journal of Sociology and Social Welfare, 13, 27-55.

Hansen, J. (1986). "Computers and Beyond in the Career Decision-Making Process." Measurement and Evaluation, 19, 48-52.

Harris, J. (1990). "If the Ruler is Warped, How Dependable are the Measurements? Presenting a Reliable and Valid LOGO-Based Computer Adaptive Assessment Tool." Journal of Educational Computing Research, 6, 1-16.

Hasenfeld, Y. (1987). "Information Management: Social Work and the Computer." UCLA Social Welfare, 2(2), 17-18.

Health, Education, and Welfare (1987). "Computer Applications."

Hepworth, D. & Larsen, J. (1989). Direct Social Work Practice. Belmont, CA: Wadsworth.

Herr, E. & Best, P. (1984). "Computer Technology and Counseling: The Role of the Profession." Journal of Counseling and Development, 63, 192-195.

Hsu, T. & Sadock, F. (1985). Computer-Assisted Test Construction: The State of the Art. ERIC Clearinghouse on Tests, Measurement, and Evaluation. Princeton, NJ: Educational Testing Service.

Kast, F. & Rosenzweig, J. (1979). Organization and Management-A Systems and Contingency Approach. New York: McGraw-Hill.

King, M. (1984). "Microcomputer Applications in a Hospital Social Work Department." In M.D. Schwartz (Ed.), Using Computers in Clinical Practice. New York: Haworth.

Knowles, M. (1980). The Modern Practice of Adult Education-From Pedagogy to Androgogy. New York: Cambridge.

Kolodner, R. (1984). "Computers and Psychiatry." Psychiatric News, 7 December 1984.

LaMarche, S.M. (1987). "Microcomputers: Application for Social Work Services." Paper presented at the United States Army Social Work Management Course. (Fitzsimmons Army Medical Center, Aurora, Colorado).

Lanyon, R.I. (1987). "The Validity of Computer-Based Personality Assessment Products: Recommendations for the Future." Computers in Human Behavior, 3 (3-4), 225-238.

Levinson, D. (1984). "Information, Computers, and Clinical Practice." In M.D. schwartz (Ed.), Using Computers in Clincal Practice. New York: Haworth Press.

Lieff, J.D. (1984). "Assess Wants, Needs Before Decididng to 'Go Computer'." In M. Curran (Staff Writer), Clinical Psychiatry News, March.

Lieff, J.D. (1984). Computers and Other Technological Aids for Psychiatric Private Practice. Washington, D.C.: American Psychiatric Press.

Lieff, J.D. (1987). "Computer Applications in Psychiatry." The Psychiatric Times, December.

Lord, F.M. (1977). "Some Item Analysis and Test Theory for a System of Computer-Assisted Test Construction for Individualized Instruction." Applied Psychological Measurement, 1(3), 447-455.

Mathisen, K.S. (1987). "Issues in Research on Clinical Computer Applications for Mental Health." In J.H. Griest, J.A. Carroll, H.P. Erdman, & D.H. Klein (Eds.), Research in Mental Health Applications: Directions for the Future. Rockville, MD: U.S. Department of Health and Human Services.

Mattaini, M.A. & Kirk, S.A. (1991). "Assessing Assessment in Social Work." Social Work, May.

Mayor, M. (1992). "On Line." The Chronicle of Higher Education, XXXVIII(1), 22 January.

Meier, S.T. & Geiger, S.M. (1986). "Implications of Computer-Assisted Testing and Assessment for Professional Practice and Training. Special Issue: Computer Applications in Testing and Assessment." Measurement and Evalualtion in Counseling and Development, 19(1), 29-34.

Moreland, K.L. (1986). "Computer-Assisted Psychological Assessment in 1986: A Practical Guide. Special Issue: Computer Assessment and Interpretation: Prospects, Promise, and Pitfalls." Computers in Human Behavior, 1(3), 221-233.

Murphy, J.W. & Pardeck, J.T. (1988). "Technology in Clinical Practice and the 'Technological Ethic'." Journal of Sociology and Social Welfare, 15(1), 119-128.

Nelson, L.R. (1986). "Using Microcomputers to Assess Achievement and Instruction." Educational Measurement: Issues and Practice, 3(2), 22-26

Nurius, P.; Richey, C.A.; & Nicoll, A.E. (1988). "Preparation for Computer Usage in Social Work: Student Consumer Variables." Journal of Social Work Education, 24(1), 60-69.

Nurius, P. & Hudson, W.W. (1989). "Computer-Based Practice: Future Dream or Current Technology." Social Work, 33, 357-362. In D.H. Hepworth & J.A. Larsen (Eds.), Direct Social Work Practice. Belmont, CA: Wadsworth.

Nurius, P. & Cnaan, R.A. (1991). "Classifying Software to Better Support Social Work Practice." Social Work, 36(6), November

Olsen, J.; Cox, A; Price, C.; & Strozeski, M. (1990). "Development, Implementation, and Validation of a Computerized Test for State-Wide Assessment. Speical Issue: Computer Applications for Testing: Examples of Implementation in the Field." Educational Measurement: Issues and Practice, 9(2), 7-10, 32.

Oosterhof, A. & Salisbury, D. (1984). Some Measurement and Instruction Related Considerations Regarding Computer Assisted Testing. Paper presented at the Annual Meeting of the American Educational Research Association (68th, New Orleans, Louisiana, 23-27 April).

Pardeck, J.T. & Schulte, R.S. (1990). "Computers in Social Intervention: Implications for Professional Social Work Practice and Education." Family Therapy, 17(2), 109-121.

Parker, M.W.; Chynoweth, G.G.; Blankenship, D.; Zaldo, E.; & Matthews, M. (1985). A Review of Graduate Programs in Social Work. Washington, D.C.: Research and Evaluation Department, Walter Reed Army Institute of Research.

Pinkerton, G.L. & Rufford, P.R. (1984). "Colleagues: Confronting the Attitudes and Professionals Toward Microcomputers." In M.D. Schwartz (Ed.), Using Computers in Clinical Practice. New York: Haworth.

Poirot, J. & Heidt, M. (1982). "Planning for Educational Computing: A Questionnaire for Education." Electronic Learning, 2(1), 34, 36-38.

Psychiatry. (1985). "Computers in Psychiatry." March.

Psychiatric News. (1987). "Computer-Assisted Diagnosis May Be Answer to Improving Accuracy, Efficiency." 17 July.

Raffner, D.C. (1982). "Computer Literacy." Social Work Administration, July-August.

Reamer, F.G. (1986). "The Use of Modern Technology in Social Work: Ethical Dilemmas." Social Work, November-December.

Robinson, L. (1987). "Let the Computer Introduce Itself to Education Majors." Paper presented at the Annual Meeting of the Association of Teacher Educators (Houston, Texas, 15-18 February 1987).

Roeber, E.D. (1984). "Using Microcomputers to Assess Achievement and Instruction." Educational Meassurement: Issues and Practice, 3(2), 22-26.

Sampson, J.P. (1983). "An Integrated Approach to Computer Applications in Counseling Psychology." The Counseling Psychologist, 11, 65-74.

Sampson, J.P. & Pyle, K.R. (1983). "Ethical Issues Involved with the Use of Computer-Assisted Counseling, Testing, and Guidance Systems." Personnel and Guidance Journal, 61, 283-286.

Sampson, J.P.; Carol, A.; & Ryan, J. (1985). "Guide to Microcomputer Software in Testing and Assessment." Newsnotes, 20(4). Kansas City, MO: Association for Measurement and Evaluation in Counseling and Development.

Sampson, J.P. (1990). "Computer-Assisted Testing and the Goals of Counseling Psychology." Counseling Psychologist, 18(2) 227-239.

Schneiderman, L. (1987). "Dean's Message: The New Technology." UCLA Social Welfare, 2(2), 2.

Schwartz, M. (1985). "Computers in Psychiatry." Psychiatry, March.

Siegal, C. & Alexander, J.J. (1987). "Research Activities and Their Methodologies in Mental Health Computing." In J.H. Griest, J.A. Carrol, H.P. Erdman, & M.H. Klein (Eds.), Research in Mental Health Computer Applications: Directions for the Future. Rockville, MD: U.S. Department of Health and Human Services.

Stoloff, M.L.; Couch, J.V.; & Brewster, J. (1991). Hardware, Software, and the Mental Health Professional. Washington, D.C.: American Psychological Association.

Sullivan, R.J. (1990). "Human Issues in Computerized Social Services." Child Welfare, 59, 401-406.

Taintor, Z. (1987). "Chronic Mental Illness and Computer Uses." In J.H. Griest, J.A. Carroll, H.P. Erdman, & M.H. Klein (Eds.), Research in Mental Health Computer Applications: Directions for the Future. Rockville, MD: U.S. Department of Health and Human Services.

TekiniComp Associates, Inc. (1987). Hospital Social Work Information System. Dayton, Ohio.

The Chronicle of Higher Education. (1992). "Computer Software." XXXVIII, 22, January.

Tiedeman, D.V. (1983). "Flexible Filing, Computers, and Growing." The Counseling Psychologist, 11, 33-47.

Toffler, A. (1980). The Third Wave. New York: William Morrow.

Tombaugh, J.W. (1983). "Research for Computer Applications." Behavior Research Methods and Instrumentation, 15(2), 222-227.

Torardi, M.M. (1985). The Development of a Computer Literacy Assessment Instrument. Paper presented at the Annual Convention of the Association for Educational Communications and Technology (Anaheim, California, 17-23 January).

Ward, W.C. (1983). "Using Microcomputers to Administer Tests." Educational Measurement: Issues and Practice, 3(2), 22-26.

Watson, J.E. (1983). "The Impact of Technology on the Future of Health/Illness Education." Health Education Quarterly, 10.

APPENDIX A

GLOSSARY OF COMPUTER TERMINOLOGY

Glossary of Computer Terminology

APPLICATION SOFTWARE - Includes the programs that perform tasks such as word processing, spreadsheets, and database.

ASCII (American Standard Code for Information Interchange) - Standardized code assigned to alphanumeric characters.

BASIC (Beginner's All-Purpose Symbolic Instructional Code) - The popular language for personal computer use. It most resembles English in its commands to the computer.

BAUD - the number of bits per second that can be transmitted in a computer system. Often seen when referring to MODEMS.

BINARY NUMBER - Number system using two digits, 0 and 1, to express all numeric values.

BIT - Basic unit of computer memory, an abbreviation for binary digit.

BPS (Bits Per Second) - A measure of transmission speed that concerns either transmission or receiving data.

BYTE - A group of eight bits treated as a unit, with one byte storing a unit of information such as the code for one unit.

CASSETTES - The slowest and cheapest method of storing information in microcomputers. Cassettes are similar in appearance and function to those used for tape recorders. Cassettes are not considered feasible for computer systems when data must be retrieved rapidly.

CATHODE RAY TUBE (CRT) - A screen resembling a television picture tube, used with small computers to display computer output. Sometimes called Video Display Terminal (VDT).

CENTRAL PROCESSING UNIT (CPU) - The "intelligence" or brain of a computer, made up of one or more silicon chips, each about the size of a thumbnail. A chip is also called a MICROPROCESSOR, containing microsopic electronic pathways through which instructions and data run in the form of electrical currents.

CHIP - A component made of silicon that contains electronic circuitry. Chips acts as the computer's memory and makes it possible for the computer to perform arithmatic functions.

COBOL (Common Business Oriented Language) - High-level language used primarily large (mainframe) or medium (minicomputers) sized computers.

CPU (Central Processing Unit) - The silicon chip or wafer where computing actually takes place.

CURSOR - A little flashing square on the CRT screen used as a position marker.

DATA - Information that is entered into or taken out of a computer.

DATA BANK - A computer library, or electronic storehouse of information.

DATABASE - A stored collection of information.

DATA PROCESSING - Process of converting data into machine readable form so the computer can work on it.

DIF (Data Interchange Format) - A spreadsheet data format originally developed for VisiCalc.

DIP (Dual In-line Package) - The toggle box, or switches, where you select hardware features.

DISK - A flat circular piece of plastic coated with magnetic material similar to phonograph records and used to store programs and data. Disks can be both 'hard' or 'floppy.'

DPI - (Dots Per Inch) - A measure of the density of dot-matrix characters.

EGA (Enhanced Graphics Adapter) - A graphics adapter board which drives high-resolution monitors.

FLOPPY DISK - Nonrigid disks about lthe size of a 45 rpm record and the most commonly used to store computer information. Also called diskettes.

FORTRAN (FORmula TRANslation) - High level computer language developed for mathematical and engineering applications that runs programs more quickly than BASIC and can be used on larger home computers (microcomputers).

HARDWARE - The physical parts of a computer system, encompassing all the machinery and circuitry.

HARD DISK - Rigid disks that store much more data than floppy, or flexible disks and used most often with business application computers.

INFORMATION SYSTEMS DEPARTMENT - The department is responsible for the organization's shared database system computer and storage and retrieval of data.

INPUT - That which is entered into computers (either data or programs).

K - An abbreviation for kilo or 1,000. One K equals 1,024 characters of information. Total memory may be determined by the following formula: K x 1024. For example, a computer with 64K of memory is capable of storing 65,536 characters of information.

LOGO - A general use language for use in educational settings.

MAINFRAME COMPUTERS - The largest computers, storing enormous amounts of data and used in places like the U.S. Army Finance and Accounting Center, NASA, and major corporations.

MEMORY - The CPU's information storage ability, the size of which determines what the computer can do.

MICROCOMPUTERS AND PERSONAL COMPUTERS - The smallest computers with fewer capabilities than mainframe or minicomputers but very useful in small businesses, education, and individual offices. When placed in a home they become known as HOME COMPUTERS (i.e., Apple, Atari, Commodore, IBM PC).

MINICOMPUTERS - Medium-sized computers, also found in large businesses, with less storage capacity than mainframe equipment. The MINICOMPUTER would be found in hospitals or medical centers (i.e., Patient Administration Division or Office of the Comptroller).

MIPS - (Millions of Instructions Per Second) - Look for this measure of processing speed on 80386 machines.

MODEM (MOdulator DEModulator) - Links a computer to another computer via telephone lines. Essential for sending messages to other computer users or tying into a data bank or mainframe computer.

PASCAL - A language used on larger home computers for business and general purpose programs. Named after French philosopher-mathematician Blaise Pascal.

PC - Personal computer (microcomputer).

PERIPHERALS - Usually hardware devices external to the computer itself, such as disk drives, modems, cassette-tapes, drives and printers.

PILOT (Programmed Inquiry Learning or Teaching) - An easy-to-learn language designed for beginning programmers and for use on smaller personal computers.

PRINTER - A device that produces printed copies of information in the computer

PRINTOUT - Printed information, sometimes called "hard copy."

PROGRAM - a group of instructions that tells the computer what to do.

SOFTWARE - Programs that give instructions to the computer, without which the computers does nothing.

SPREADSHEETS - Electronic worksheet, uses the computer's monitor as an easily erasable worksheet.

SYSTEM SOFTWARE - The general purpose programs that are needed to keep the machinery going, sometimes referred to as the OPERATING SYSTEM.

RAM (Random Access Memory) - Temporary memory that stores specific instructions and data for any program that is being run.

ROM (Read Only Memory) - The computer's permanent memory, containing basic instructions the CPU follows in processing any kind of information.

WORD PROCESSING - Means of creating, manipulating and storing text on a CRT screen.

WORD PROCESSOR - Software that gives the user the agility to write and edit information in text form. The entire text may be entered into the computer's memory for future recall.

APPENDIX B

COMPUTER DESCRIPTION

Computer Description

DESCRIPTION	UNIT PRICE
IBM-Advanced System, including 1 Mb RAM, one printer port, one serial port, one output port, one graphics tablet input port, one parallel port, one 5½" floppy disk drive, one 20 Mb hard disk drive, keyboard/video subsystem, MS-DOS operating system, MS-BASIC interpreter, clock/calender and manuals.	$1,658.00
2 Mb Memory Expansion, expands to 3.1 Mb.	240.00
Dot Matrix Printer, MPI Printmate 350.	528.00
Graphics Input Device, Summagraphics MM1200.	293.00
MS-BASIC, Compiler Requires 128k RAM, 187k Disk Space	46.00
Wordstar, Word Processor Requires 192k RAM, 226k Disk Space	130.00
dBase II, Database Management Requires 128k RAM, 127k Disk Space	239.00
Cad Key Composition Graphics Requires 512k RAM, 900k Disk Space Recommend use with hard disk only.	280.00
TOTAL:	$3,414.00

APPENDIX C

CHECKLIST FOR DEVELOPING AGENCY DATABASE SYSTEM

Checklist For Developing Agency Database System

___ Review the effectiveness of the agency's data collected under the current manual information system and revise according to goals of the agency.

___ Know the type of data being retained by the computer.

___ Determine if information in the computer can solve problems.

___ Become familiar with the agency computer system by speaking with management information personnel.

___ Discuss the effectiveness, applications, and problems of a computer system with other departments or agencies.

___ Get to know the functions of the Information Systems Department and let them know about your interests in computer utlization.

___ Determine the data needed to enhance agency functioning.

___ Determine who must be included in the planning/implementing of the system.

___ Select the data to be stored in the computer system.

___ Determine how information will be gathered.

___ Choose the individual(s) responsible for entering data into the computer.

___ Choose the individual(s) responsible for providing back-up to the primary person(s) entering data into the computer.

___ Determine which training will be required for persons involved in the system and provide that training.

___ In conjunction with the Information Systems Department, code data to be entered into the computer.

___ Compare the results of the computer reports with the manual reports in a testing and assessment/evaluation period before totally converting to the computer system.

APPENDIX D

COMPUTER SOFTWARE

Computer Software

The following list of computer software has been compiled from information provided by the publishers or by companies marketing the programs (CHE, 1992). These examples of computer software illustrate how social workers could utilize computer programs to enhance their work and computer skills.

COMPUTERIZED INSTRUCTION. "Create, Revive, Test," for IBM PC and compatibles. Lets students enter notes, questions, and answers in the computer, review materials, and test themselves: keeps track of problem areas and focuses reviews and testing in those areas; $35.00. CONTACT: Macrosoft, Inc., P.O. Box 400, Hill City, South Dakota 57745.

CONFERENCES. "Conference Coordinator," for IBM PC and compatibles. Manages registrations for conferences, conventions, and workshops; prepares badges, confirmations, invoices, labels, personalized letters, reports, and rosters; tracks income and expenses; $1,295. CONTACT: ACEware Systems, 1828 Erickson, Manhattan, Kansas 66502

DATA MANAGEMENT. "History Database," for IBM PC and compatibles. Lets researchers and others enter data and edit text by filling out a data-entry form; allows researchers to transfer information from database to word processor in first-draft form; inserts footnotes, heading, table of contents, index, and bibliography manuscripts; $495. CONTACT: History Database, 24851 Piuma Road, Malibu, California 90265.

EXAM PREPARATION. "MicroTestIII," for Apple Macintosh. Lets user create banks of up to 15,000 test questions and print tests with up to 300 questions; will produce multiple-choice, matching, true-false, fill-in-the blank, short-answer, and essay questions; numbers pages and questions; includes diagrams, graphics, and figures; $134. CONTACT: Chariot Software Group, 3659 India Street, San Diego, California 92103

EXPERT SYSTEM. "Acquire," for IBM PC and compatibles. Includes two systems that let users with no programming experience create information-based applications; the Knowledge Acquisition System allows subject-matter experts to create knowledge bases representing their problem-solving expertise; the Expert System Shell lets experts test examples; lets users design their own data-input procedures and report formats; $495. CONTACT: Acquired Intelligence, Inc., 1095 McKenzie Avenue, Suite 205, British Columbia V8P 2L5.

MEDICINE. "Introduction to Medical Terminology," for IBM PC and compatibles. Interactive tutorial helps students learn basic concepts of medical language; includes prefixes, suffixes, word roots, and common abbreviations; color graphics illustrate key concepts; $149.95. CONTACT: Abuse Education, Inc., 670 South Fourth Street, Edwardsville, Kansas 66113.

PROGRAMMING. "Pascal Genie," for Apple Macintosh. Teaches students in introductory programming courses about

programming tools; integrates the editor, run-time, and debugging systems; $25. CONTACT: Chariot Software Group, 3659 India Street, San Diego, California 92103.

WRITING. "Writer's Helper," for IBM PC and compatibles. Requires "Windows." Introduces students to writing as a three-step process, including pre-writing, drafting, and revising; pre-writing activities include finding and exploring a topic using "prompts," including story leads, quotations, facts from the Statistical Abstracts of the United States, and journalism's "Five W's"; revising activities include structuring information, identifying the audience, and checking writing for problems; $135. CONTACT: CONDUIT, University of Iowa, Oakdale Campus, Iowa 52242.

Renaissance Series
Adolescent and Child Reports

CHILDREN'S PERSONALITY QUESTIONNAIRE & HIGH SCHOOL PERSONALITY QUESTIONNAIRE. These programs are similar to the Sixteen Personality Factor Questionnaire Narrative Report, configured for the unique factor composition of each of these instruments. The HSPQ includes a Holland theme career profile based upon pattern analysis. These programs are sold together as a set. CONTACT: The Institute for Personality and Ability Testing, P.O. Box 188, Champaign, Illinois 61820, 1-800-225-4728 or 217/352-4739.

JESNESS INVENTORY NARRATIVE REPORT. This program provides narrative reports based upon entry of scaled scores for the ten standard scales and Asocial Index. The Jesness

Inventory is a useful instrument in the classification and treatment of delinquent and disturbed adolescents. CONTACT: Consulting Psychologists Press, P.O. 60070, Palo Alto, California 94306, 415/857-1444.

MILLON ADOLESCENT PERSONALITY INVENTORY. The MAPI Narrative Report generates clear, well written interpretation reports for this very useful tool in the assessment of adolescent personality and behavior. The report is organized into sections for Test-taking behavior, Personality Patterns, Expressed Concerns, and Behavioral Correlates. This is an alternate report form primarily for the frequent MAPI user since the program requires entry of scaled scores and hand-scoring materials are not currently available through the publisher. CONTACT: National Computer Systems, P.O. Box 1416, Minneapolis, Minnesota 55440, 1-800-328-6759 or 612/933-2800.

PERSONALITY INVENTORY FOR CHILDREN NARRATIVE REPORT. Results from administering this instrument are easily compiled in report form through this program. The report is divided into these sections--Validity Profile, General Impression, Family Environment, School Achievement, Interpersonal Relations, Behavioral and Emotional Problems, and Somatic Complaints. Scaled scores for the validity scales and thirteen standard scales are entered following administration of at least the first three parts of the instrument. CONTACT. Western Psychological Services, 12031 Wilshire Boulevard, Los Angeles, California 90025, 213/478-2061.

WISC-R NARRATIVE REPORT. This program provides an analysis of test scatter and then integrates this information into a narrative report describing areas of strength and weakness. The narrative format allows test data to be more easily integrated into an assessment report and greatly reduces report writing time. The program requires entry of scaled scores for all I.Q. and subtest scores. CONTACT: The Psychological Corporation, P.O. Box 9954, San Antonio, Texas 78204-0954, 1-800-233-5682.

Renaissance Series - Adult Reports

MILLON CLINICAL MULTIAXIAL INVENTORY NARRATIVE REPORT. The MCMI Narrative Report provides clear, high quality interpretation reports for this contemporary psychological assessment instrument. Descriptive and diagnostic information is provided concerning both maladaptive personality traits (Axis II Personality Disorders) and clinical syndromes (Axis I Clinical Disorders). The program requires entry of Base Rate scores for all scales. CONTACT: National Computer Systems, P.O. Box 1416, Minneapolis, Minnesota 55440, 1-800-328-6759, 612/933-2800.

MCMI-II NARRATIVE REPORT. The MCMI-II Narrative Report reflects all changes in the revised version of this test. It incorporates more complex validity decision rules and a more attractive graph as well as interpretive and diagnostic information for the new personality scales. The program requires entry of Base Rate scores and hand-scoring materials have not been released by the publisher. However,

a Profile Report (scoring only) is available through National Computer Systems at a greatly reduced price relative to interpretation reports. This program is bundled with the MCMI Narrative Report (above) and sold together as a set.

MINNESOTA MULTIPHASIC PERSONALITY INVENTORY NARRATIVE REPORT. This sophisticated interpretation system provides complete narrative reports based upon pattern analysis and single scale levels. The interpretation capability extends to moderate and relatively normal profiles. The program requires entry of scaled scores, providing the flexibility to choose standard or revised norms. CONTACT: National Computer Systems, P.O. Box 1416, Minneapolis, Minnesota 55440, 1-800-328-6759, 612/933-2800.

SIXTEEN PERSONALITY FACTOR QUESTIONNAIRE NARRATIVE REPORT. The 16PF Narrative Report generates complete interpretation reports based upon entry of sten scores for the validity (fake) scales and sixteen personality scales. The report is organized into sections for Interpersonal Relationships, Coping with Stress, Independence, Determination and Decisiveness, and Intelligence. There is also a Career Profile, indicating the Holland themes associated with each personality configuration. CONTACT: The Institute for Personality and Ability Testing, P.O. Box 188, Champaign, Illinois 61820, 1-800-225-4728, 217/352-4739.

WAIS-R NARRATIVE REPORT. This program provides an analysis of test scatter and then integrates this information into a narrative report describing areas of strength and weakness. The narrative format allows test data to be more easily integrated into an assessment report and greatly reduces interpretation time. The program requires entry of scaled scores for all I.Q. and subtest scores. CONTACT: The Psychological Corporation, P.O. Box 9954, San Antonio, Texas 78204-0954, 1-800-233-5682.

Clinical Assessment Tools for Social Workers

ACKERMAN-SCHOENDORF SCALES FOR PARENT EDUCATION OF CUSTODY (ASPECT). ASPECT is a clinical tool that helps you make child custody recommendations. Used with parents seeking custody of their children, ASPECT assesses the mother and father separately. It considers various factors related to the "best interests" of the child and produces quantitative score for each parent. The clinician answers these questions, using information from the following sources: (1) The ASPECT Parent Questionnaire; (2) Interview with and observation of the parent (with and without the child); (3) Test data from the MMPI or MMPI-2, Rorschach, WAIS-R, WRAT-R, or Norris Educational Achievement Test (NEAT), and various tests administered to the child. CONTACT: Western Psychological Services, 12031 Wilshire Boulevard, Los Angeles, California 90025-1251, 1-800-648-8857.

ENDLER MULTIDIMENSIONAL ANXIETY SCALES (EMAS). These scales are three related self-report measures of anxiety. Based on Endler's interaction model of personality, these scales allow greater precision in assessing and predicting anxiety across situations. They can be used with a wide range of people, including adolescents, adults, clinical patients, the elderly--anyone who reads at an eighth-grade level or higher.

The first scale, EMAS-State (EMAS-S), measures state anxiety--the individual's actual transitory response. It assesses both physiological and cognitive responses.

The second scale, EMAS-Trait (EMAS-T), measures trait anxiety--the individual's predisposition to experience anxiety in four different types of situations: socially-evaluative, physically dangerous, new or ambiguous, and routine.

The third scale, EMAS-Perception (EMAS-P), evaluates the individual's perception of the type and intensity of threat in the immediate situation.

CONTACT: Western Psychological Services, 12031 Wilshire Boulevard, Los Angeles, California 90025-1251, 1-800-648-8857.

INTERPERSONAL BEHAVIOR SURVEY (IBS). The IBS identifies interaction styles that may lead to conflict--at home, on the job, or in school. Used in individual or group therapy, assertiveness training, marriage and family counseling, and career guidance, the IBS measures various dimensions of

of assertive and aggressive behavior, identifying excesses and deficits in both. CONTACT: Western Psychological Services, 12031 Wilshire Boulevard, Los Angeles, California 90025-1251, 1-800-648-8857.

PSYCHIATRIC DIAGNOSTIC INTERVIEW (PDI-R). The PDI-R is a convenient structured interview that simplifies diagnosis. It helps you determine whether an individual is suffering, or has ever suffered, from a major psychiatric disorder. The PDI-R saves time, reduces the chance of diagnostic error, and provides a reliable record of presenting complaints, symptoms, previous treatment, positive syndromes, and DSM-III-R diagnoses. CONTACT: Western Psychological Services, 12031 Wilshire Boulevard, Los Angeles, California 90025-1251, 1-800-648-8857.

SUICIDE PROBABILITY SCALE (SPS). The SPS gives social workers a rapid, accurate, and empirically validated measure of suicide risk in adults and adolescents over 13 years of age. The SPS is widely used as a screening device in clinics, inpatient units, juvenile detention centers, hospital emergency rooms, and suicide prevention centers. It is especially useful with suicidal individuals who are being maintained in outpatient psychotherapy, where continuous, systematic monitoring is particularly important. CONTACT: Western Psychological Services, 12031 Wilshire Boulevard, Los Angeles, California 90025-1251, 1-800-628-8857.

Psychiatric Computing

COMPUTERIZED PSYCHIATRIC NOTE. Creates SOAP format psychiatric note (admission, progress, discharge, etc.) and hospital admission orders. Includes Standardized Mental Status Examination, psychiatric medications, DSM-III-R codes and diagnoses. Excellent for psychiatric emergency rooms, residency programs, outpatient clinics. Program creates over forty percent of report text, and over eighty percent of orders text. Requires IBM Compatible; $135.00. CONTACT: Charles W. Juels, M.D., at 602/957-2901.

DECISIONBASE. Uses this IBM PC-compatible software to diagnose more than 200 DSM-III-R psychiatric disorders. Both a psychiatric diagnostic assessment and complete medical-psychiatric report are generated by the patient, informant, or therapist. An on-line textbook gives a detailed description and treatment recommendation for each diagnosis. All patient records are stored in a database for easy selective retrieval. Progress notes and lab results are automatically graphed and statistically analyzed. WAIS-R and WISC-R interpretations are automatically generated; $595.00. CONTACT: Phillip W. Long, M.D., Decisionbase, Suite 8110-420, 264 H St., Blaine, Washington 98230, 604/876-2254.

MACINTOSH - OFFICE MANAGEMENT SYSTEM. Appointment scheduler, billing, insurance statements and insurance reports, split payments, bank deposits, automatic collection letters, progress notes, prescriptions, patient reports, referral

letters; time saver, money saver, and organizer for the individual or clinic; $1,250. CONTACT: American Management Systems, Suite 234, 3000 Connecticut Avenue, Washington, D.C. 20008; 202/232-8608.

PSYCOMNET. The computer-based telecommunications system for psychiatrists. Earn Category I CME credits while participating in authoritative on-line clinical conferences. Use any computer or modem. CONTACT: PsyComNet, 1346 Lexington Avenue, New York, New York 10128.

PSYSEARCH. For IBM and 100% compatible computers. A Psychiatric Expert System that provides reliable DSM-III-R data, in a variety of ways. It takes patient history as input to generate the indicated Diagnosis, Axis I, II, IV, V. Its use can be tailored to the needs of the mental health team, or to the clinical practice needs of the solo practitioner; $185. CONTACT: Psyware Software, P.O. Box 12876, Tallahassee, Florida 32317; 904/893-3794.